

West Lake Landfill Superfund Site

Bridgeton Landfill Thermal Isolation Barrier Investigation Phase 1 Report, December 2014

USACE Review Comments – submitted to EPA January 30, 2015

- 1) General: Recommend the RPs perform additional bounding sampling near elevated locations to determine whether contamination extends outside these areas where no "clean" borings exist.
- 2) General: Recommend the RPs perform additional sampling southward towards the North Quarry area. Ideally sampling should be placed on a systemic grid to ensure full coverage, given the heterogeneity of how RIM was placed in the landfill. There is a lot of value in using historic imagery to try to identify areas of potential concern. Recommend RPs obtain and utilize aerial imagery to help support sampling locations, if it is available. This imagery would need to be cited and copies provided in reports to justify sampling locations if other than a grid is utilized.
- 3) General: Recommend the RP/EPA revisit some assumptions of the Baseline Risk Assessment using this new data and future collected data as part of the RIM characterization to ensure site conditions are still similar to what has been assessed. It's possible to calculate the total amount of Thorium-230 disposed of in 8,700 tons of waste material, the total activity is $\sim 1.5E15$ pCi.

Using the UCL95 values provided in the BLRA you arrive at a total accounted for activity of $1.3E15$, or about 90% of the total activity. Material is accounted for, which is probably a pretty good estimate.

Conversely, if the average value is used, you arrive at an accounted for activity of only $7.5E14$, which is roughly 50% of the total activity. Material...

With this new data it's possible the material is present in a larger area (seems to be the case supported by new data). Area 2 still makes up the bulk of contaminated media, is present in thicker layers, and/or is present at higher activity than what was assumed in the BLRA (and has been carried through to documents up to, and including the 2008 ROD).

- 4) Figures: If the data is available it would help to also plot the results of samples below the depth of contamination. Gamma results plotted for the interval below the highest results. i.e. it's helpful at location Sonic 1-2 to see that the sample immediately below the high sample was non-detect, whereas at Sonic 1C-6 it's not immediately clear if a "Clean" sample was ever identified. It would also help to perhaps color code or otherwise identify borings where elevated material is found. If the posting plots are useful, it's hard to get a good visual summary of the data as presented.
- 5) Section 1, pg 7, paragraph: Report states, "Although these criteria identify levels that would allow for unrestricted use of the site (which as indicated above is not realistic or allowed at a solid waste disposal facility), these criteria have no relation to risk-based criteria for a solid waste landfill or levels that would be protective if an SSE were to occur in these materials." Recommend that report also state that risk-based criteria for this site has not been determined, therefore, comparison of unrestricted use criteria is being used.
- 6) Section 1.1.2.2, pg 8, paragraph 4: Report states that monthly groundwater levels measured in 2000 and 2005 indicate that groundwater generally occurs only in the underlying alluvium at or below the base of the landfill material. Recommend that report also state that risk-based criteria for this site has not been determined, therefore, comparison of unrestricted use criteria is being used.

recent groundwater levels be reviewed and also cited to indicate whether current data also shows the groundwater at or below the depth of waste. Or could reference section 7.2 to indicate that 2013 investigation results confirm conditions still indicate fluid levels at or below the base of the landfill material, which is consistent with the 2000 groundwater levels.

- 7) Section 1.1.3, page 9: This paragraph references the proposed thermal isolation barrier location. Two alignment have been proposed. Recommend including a figure or figures to indicate which IB location is being referred to.
- 8) Section 1.1.3.2, page 9, paragraph 2: Report states Lab analysis of surface soil samples (the upper 6 inches) detect radionuclides at levels above 5 pCi/g above background at boring locations WL-106 and WL-114. Figure 2 only shows 106B. Is this the same well as WL-106?
- 9) Figure 2: Figure references "elevated" and "non-elevated" historical boundaries. Recommend all figures be changed to quantify the "elevated" levels. Also recommend that areas of surface RIM be clearly identified.
- 10) Section 3.2.5, page 17, paragraph 2: In this paragraph, and at several other locations in the document, it is stated screening value of 200-250 cps was used to identify potentially elevated gamma readings. Recommend an explanation provided on how that screening level was determined.
- 11) Section 4.2.1, page 24, paragraph 2: Last sentence states, "Samples were then geologically logged, photographed for radiation, and samples for radiological analyses were selected." Recommend this section be expanded to indicate how samples for radiological analyses were selected and how the number of samples selected was determined or refer to 4.4 where further discussion is provided.
- 12) Section 4.2.2, page 25: Section identifies sonic borehole locations selected if GCPT data indicated the potential for elevated gamma (2, 5-3, 1C-6). Also states 8-1 and WL-119 were selected to further understand slightly elevated GCPT sounding readings. Should the "if" be changed to "because"? "if" implies the borings were pre-selected. Also, there is no mention of whether boreholes 12-5, 13-3, 13-6, 14-2, 14-4, 14-5, 14-7, 15-2 (& 2A), 16-3, and 16-6 were drilled.
- 13) Section 4.4, page 27, paragraph 1: States "Intervals with elevated gamma readings were selected for offsite laboratory analysis." Recommend adding text to clarify what constitutes an "elevated gamma reading". Also, recommend clarifying the samples taken from the interval were from locations that exhibited the highest 2 gamma reading in each interval. How many samples taken if there were no elevated gamma readings? Was there an attempt to collect samples above and below the elevated readings to identify if the vertical extent of RIM had been identified?
- 14) Section 5.3.1, page 31, paragraph 2: TLD monitoring information is discussed. Recommend EPA determine if they want these results summarized in an appendix to be able to verify the effort and results.
- 15) Section 5.3.5 and 5.3.6, page 32: Recommend EPA determine if they want to see results for survey logs for daily gamma radiation surveys and four gas monitoring included in an appendix so EPA can verify the effort and results.
- 16) Section 5.3.5, page 32: This section does not provide narrative summary of results of four gas monitoring as the comment do. Recommend results summary statement be included, since backup data isn't provided in an appendix.
- 17) Section 5.3.8.1, page 33: Recommend stating how alpha readings above 20 dpm/100cm² and beta-gamma readings above 1000 dpm/100 cm² were determined to be contaminated. This comment would apply to sections 5.3.8.2 and 5.3.8.3. Also use this same reference level.

Section 6, page 34, paragraph 1: States " based upon review of historic images, it was determined during the investigation that a deeper quarry existed in the southeast portion of OU1 Area 1 that could be problematic to the barrier design. " referring to Bridgeton Sanitary LF N. Quarry? If so, should state that so it doesn't appear to be some newly identified quarry.

- 19) Appendix C3 & Figure 6: Sonic downhole borehole log and core scan shows columns for samples collected and shown. Figure 6, sonic boring 1-2 shows a sample was collected at depths of 8-9', 18-19', 20-21', 22-23', 24-25', 28-29', 33-34', 38-39', and 40-41' and results were provided. However, the sample shipped box on the log was only checked for samples 39-40'. Recommend boring logs be checked to ensure they are complete and correct.
- 20) General: Recommend another set of figures be generated that contain all results, including past sample results and a sample for each radionuclide to facilitate a better understanding of RIM distribution in Area 1. Recommend removing historical interpolated boundaries from these additional figures as they have been disproven.
- 21) Cross Sections: Recommend the lab results for sonic borings in each cross section at each depth a sample was collected be shown. Cross referencing between logs, downhole scans, and lab reports is confusing and time-consuming; having the pertinent data at one glance would aid in understanding the contaminant distribution.
- 22) Figure 14: The profile shows GCPT-12 hit alluvium at elevation 442. However, on the 1971 aerial it appears the elevation at this location is ~432 along the edge of what appears to be a lagoon and is where the 1C-12 is located. In a 1973 aerial it appears the lagoon is essentially filled in. Is it possible that what is being classified as alluvium is actually spoils from a quarrying operation or some other type of fill?